Upper Broad Run and Upper Foley Subareas
Comprehensive Plan Amendment
Draft Future Land Use Plans and Community Illustrative Plans August 22, 2005

The Loudoun County Planning Department asked Sympoetica, a land planning and design firm, to develop two alternative land use plans for the Upper Broad Run and Upper Foley Subareas based on the background information provided in five issues papers presented to the Planning Commission on July 25 and general guidance provided by the Planning Commission regarding desired uses and densities. Sympoetica prepared the two draft alternative land use plans, which are depicted in two future land use maps and described programmatically by two spread sheets. Accompanying each alternative future land use map is a "community illustrative" plan, which provides a conceptual illustration of future development of the subareas with green infrastructure open space and needed public facilities located (such as schools, libraries, public safety centers, recreation centers, parks). The latter is intended merely as an illustration, since the exact locations of many of the features will be determined over time through the joint efforts of the county and the private sector.

Overarching Goals for Both Alternative Plans

The general goals for both alternative plans were as follows:

- To develop a land use plan that achieves the equivalent of 4.0 dwelling units per acre in the Upper Broad Run Subarea and 3.0 dwelling units per acre in the Upper Foley Subarea. The total number of units for the two alternative plans will be approximately the same, though the units may be distributed in different patterns across the two subareas.

- To provide a transition of densities from the Suburban Area on the east to the Rural Area on the west so as to ensure compatibility with surrounding communities.

- To provide opportunities for a wide variety of housing types, with a particular interest in providing affordable workforce housing. The overall range of housing types should match that generally found in Dulles South, namely:
    - 48% single family detached units (SFD)
    - 38% single family attached units (SFA)
    - 14% multifamily units (MF)

- To achieve a level of self-sufficiency in the area so that the people who eventually live here can also do much of their daily shopping as well as potentially work here. To this end, the plans had the following goals for non-residential uses:
    - retail goal: 50 gross square feet (GSF) per dwelling unit of retail space
    - employment goal: 3 to 4 % of the total developable land area devoted to employment uses, primarily offices.

- To develop plans that are sensitive to the environmental and historic resources constraints of the area, in particular:
    - area streams and their associated floodplains, steep slopes, wetlands and woodlands – the "green infrastructure"
    - Bull Run with its 300-foot buffer recommended by the Revised General Plan
    - the Occoquan watershed, of which the Upper Foley Subarea is a part, which drains to one of the region's major water supply sources, the Occoquan Reservoir
    - historic resources, and in particular the concentration of features south of Route 50 and west of Lenah.

- To ensure that public facilities and services can be provided at county recommended levels including such facilities as schools, parks, recreation centers, libraries, county administration space, and public safety facilities. Reasonable locations for such facilities should be shown to be potentially available.

- To assume that the entire area, i.e. both subareas, will be provided with public water and sewer service through the development process and/or county action.

- To test the alternatives with regard to the adequacy of the transportation system to handle the projected traffic from the proposed development of the area.

Process for Developing the Alternative Land Use Plans and Community Illustratives

Sympoetica met with the county planning staff to develop these goals and collect background data on the two subareas, including the five issues papers. It was decided in this meeting that density should be calculated based on the Zoning Ordinance, which excludes major floodplain and non-residential land from the land area on which density credit is given. We also determined which lands had already been developed, were approved for development, or were expected to be approved for development in the near future. These lands were excluded from the future land use areas to be planned.

The next step in the planning process was to develop a map of developable lands by mapping the undevelopable major floodplain and identifying what remained. Over this information, Sympoetica laid the planned major road network. These features provided a framework for identifying development "land units" to which residential and non-residential land uses and densities and floor area ratios (FARs) could be assigned. A spreadsheet was developed so that running totals could be calculated for each subarea and the total area and compared to the goals. Sympoetica and the planning staff then met in a workshop to develop two different land use approaches: one that assigned exactly 4.0 dus/ac to Upper Broad Run and 3.0 dus/ac to Upper Foley and one that assigned higher densities to Upper Broad Run and lower ones to Upper Foley, but achieved approximately the same total number of residential units as the first approach.

Sympoetica refined the rough alternative land use plans developed in the staff/consultant workshop, prepared color rendered future land use maps and completed the spreadsheets. The planning staff and consultants then met again, this time with representatives of other county agencies with expertise in environmental issues, transportation and the array of needed public

facilities and services. In this workshop, we reviewed and improved on the land use plans, developed data on public facilities needs, and identified potential locations for the public facilities.

With this information, Sympoetica prepared the final drafts of the future land use maps, spreadsheets, and community illustratives. The latter layered onto the future land uses the green infrastructure and planned public facilities to give a conceptual picture of most elements of the communities that will develop here: the residential neighborhoods with their retail/employment centers, the retained green infrastructure open space and parks, and the needed schools, libraries, and other public facilities. The county transportation staff used the future land use maps and spreadsheets to determine transportation impacts. The planning staff in the accompanying memo provides more details on the transportation and other public facilities and services needs associated with the draft alternative plans.

Descriptions of the Two Alternative Plans

Alternative 1

This plan represents a relatively straight-forward effort to assign a residential density of 4.0 dus/ac to the Upper Broad Run Subarea and 3.0 dus/ac to the Upper Foley Subarea with a transitioning of densities generally from higher densities near the Suburban Area to lower densities near the Rural Area.

With this transitioning, the pattern is not simply 4.0 dus/ac all across Upper Broad Run and 3.0 dus/ac uniformly across Upper Foley. In Upper Broad Run, densities of the land units are 4.0 or 6.0 dus/ac in the eastern part of the subarea with a "low-density belt" of 1 du/ac hugging the edge of the Rural Area. Some of the inner land units, specifically units UBR 4, 5, 7, 8 and 14 were assigned the lower 4.0 dus/ac, while more western land units UBR 2, 3 and 10 were assigned higher densities of 6.0 dus/ac in recognition of environmental constraints. Specifically UBR 4, 5, 7, 8 and 14, generally are affected by greater amounts of floodplain, steep slopes, and wetlands than UBR 2, 3 and 10, making it more challenging to achieve the higher 6.0 dus/ac densities while protecting these green infrastructure elements. With regard to land units UBR 2, 3 and 10, we would suggest plan text that recommends internal transitioning of densities with multifamily development and town houses located closer to the Lenah Connector and single family detached housing located in the more western areas, transitioning in density to 1.0 du/ac along the western edge.

Also of note in Upper Broad Run is the assignment of lower densities (1.0 du/ac) to all of UBR 17 and 18. The lower density in UBR17 provides a transition to the existing rural hamlet, Lenah Run, which has a density of 1 du/1.81ac, as well as to the Rural Area. This land unit also exhibits a concentration of historic and archeological resources that might be more easily preserved within a clustered low density lotting pattern. UBR 18 provides a lower density transition to Lenah Run, The Marches (1 du/3.8 acres), as well as the Rural Area.

Lower Foley has an overall density of 3.0 dus/ac with a simple transition of densities from 4.0 dus/ac in the east to 3.0 dus/ac to 1.0 dus/ac along the western edge of the subarea and Bull Run.

It should be noted that the 1.0 du/ac low density belt is approximately 1000 acres wide here and in Upper Broad Run. The belt has been sized to permit a reasonable land module for one-acre lot development.

Retail and employment areas have also been included in Alternative 1's future land use plan. Two mixed use community centers (MUCC) are planned, one north and one south of Route 50. The northern one is located at the intersection of the planned Lenah Connector and the North Route 50 Collector. It is primarily an employment center with support retail and some high density housing. The southern one is located at the intersection of the Lenah Connector and Tall Cedars Parkway. It is similar in character to the northern MUCC, though it offers a higher percentage of retail square footage compared to employment square footage. In addition to the MUCCs, there are small Neighborhood Retail Centers (30 acres) and Neighborhood Convenience Centers (6 acres) located throughout the subareas within various land units. They are depicted on the future land use map and included in the spreadsheet. These centers contain both retail and office uses.

The following summarizes the land uses, residential mixes, densities and FARs for Alternative 1:

Alternative 1											
Sub-area	Total Dev. Acres	Res. Acres	Res. Density	Total Res. Units	% SFD	% SFA	% MF	Non-Res. Acres	Non-Res. FAR	Retail GSF	Employ GSF
UBR	5,531	5,186	4.0 dus/ac	20,779	46%	37%	16%	345	.22	1,156,639	2,169,167
UF	2,474	2,414	3.0 dus/ac	7,198	53%	39%	9%	60	.20	245,694	277,026
Total	8,005	7,600	3.7 dus/ac	27,977	48%	38%	14%	405	.22	1,402,333	2,446,193

This summary shows that Alternative 1 has met the land use, density and intensity goals set for it. It has achieved a density of 4.0 dus/ac in Upper Broad Run and 3.0 dus/ac in Upper Foley. The overall mix of residential types matches those found generally in Dulles South (48% SFD, 38% SFA, 14% MF). The future land use map shows a transition of densities from high in the east to low in the west. The plan provides approximately 50 GSF of retail per dwelling unit. At .20 FAR, the total land area devoted to employment is approximately 280 acres, which is about 3.5 percent of the total developable acres of the two subareas.

Regarding the other goals, the community illustrative shows how the two subareas might develop with green infrastructure open space and needed public facilities. The number and types of public facilities match the needs outlined in the accompanying staff memo. This illustrative does not portray exactly the 30% open space and 10% public/civic use areas recommended by the Revised General Plan for development at these densities. The locations of all the open space and public space will be determined during the development process and will be mixed throughout the land bays. Concerned that it may be difficult to achieve the 6.0 dus/ac densities on some of the land bays, Sympoetica tested the feasibility of achieving this density with the proposed mix of residential types. We found that the mix could be achieved if the net density of residential uses (excluding open space and public space) is about 7 dus/ac for SFD, 14 dus/ac for SFA and

25 dus/ac for multifamily. This results in very small but achievable single family lots averaging 5,600 square feet in size. Such lot sizes would be appropriate for affordable workforce housing.

The community illustrative shows a 300-foot buffer along Bull Run and protects the historic resources west of Lenah by assigning a lower density here. Clustering could result in the preservation of at least some of these resources. With regard to protecting the Occoquan Reservoir, this alternative likely recommends too much development in the Upper Foley Subarea. The Center of Watershed Protection in Ellicott City, Maryland, is a recognized expert in watershed planning in the United States. The center's book, *The Practice of Watershed Protection,* by Thomas R. Schueler and Heather K. Holland (Ellicott City, MD: Center for Watershed Protection, 2000) in Chapter 1, pages 7-18, indicates that numerous scientific studies show that the water quality and environmental integrity of streams begins to decline when impervious surfaces due to development (pavement, rooftops) exceeds 10% of the land area. Given the size of houses in Loudoun and the road requirements and driveways, development begins to exceed 10% between 1 du/ac and 1 du/2acs. So at 3 dus/ac, the development planned for Upper Foley under Alternative 1 will likely degrade the water quality of Bull Run and adversely affect the Occoquan Reservoir. As a point of reference, Fairfax County found in their water quality modeling of their portion of the Occoquan Watershed that they had to keep residential densities generally to 1 unit per 5 acres in most of the watershed to maintain water quality in the reservoir. The staff plans to ask the Occoquan Watershed Monitoring Lab to model the water quality impacts of the land use alternatives; however this could not be accomplished prior to August 22.

The accompanying staff memo addresses the transportation impacts of Alternative 1. The analysis shows that this planned development will add to an already overly congested road system.

<u>Alternative 2</u>

Alternative 2 offers approximately the same numbers of dwelling units and similar square footages of retail and office space as Alternative 1. The primary difference between the two alternatives is that Alternative 2 transfers some of the density in the Upper Foley Subarea to the Upper Broad Run Subarea. This allows a more urban development area of workforce housing to be constructed in Upper Broad Run, with lower densities, and lower resultant impervious surfaces, in Upper Foley. This concentration of development in the northern part of the study area. It provides more protection to the Occoquan watershed and it moves some of the traffic generated farther north.

In Alternative 2, most of the land units in Upper Broad Run are planned for residential development at 6.0 dus/ac. A greenbelt of very low density residential land use at 1 du/3acs is planned adjacent to the Rural Area. Again, we would suggest plan text that recommends internal transitioning of densities within the western land units planned for 6.0 dus/ac so that multifamily development and town houses are located closer to the Lenah Connector and single family detached housing is located in the more western areas, transitioning in density to 1 du/3acs along the western edge. This transitioning will of necessity ensure that SFA and MF do not abut the low density SFD in the greenbelt, but essentially this alternative presents a development design

that appears more as a hard edge between "town and country." UBR 17 and UBR 18 are planned for very low density development at 1 du/3acs in order to buffer Lenah Run, The Marches, and the Rural Area.

In Upper Foley Subarea, the densities are much reduced compared to those under Alternative 1. There is a very wide greenbelt of very low density residential use (1 du/3acs) along Bull Run transitioning to low density 1 du/ac residential use and then 4 dus/ac to the east. The overall density of Upper Foley has been reduced to 1 du per 1.3 acres, which with special attention during the development process could keep impervious surfaces to less than 10% of the land area.

Retail and employment uses of similar scale to those in Alternative 1 are also planned in Alternative 2. The two mixed use community centers (MUCCs) are planned in the same locations and are of similar land use mix and intensity/density. Neighborhood Retail Centers and Neighborhood Convenience Centers are also provided within the land units, but more are provided in Upper Broad Run than in Upper Foley to match the higher number of dwelling units there.

The following summarizes the land uses, residential mixes, densities and FARs for Alternative 2:

Alternative 2											
Sub-area	Total Dev. Acres	Res. Acres	Res. Density	Total Res. Units	% SFD	% SFA	% MF	Non-Res. Acres	Non-Res. FAR	Retail GSF	Employ GSF
UBR	5,531	5,156	5.0 dus/ac	25,904	45%	39%	15%	375	.23	1,354,410	2,398,284
UF	2,474	2,462	1 du/1.3ac	2,058	82%	18%	0%	12	.20	52,272	52,272
Total	8,005	7,618	3.7 dus/ac	27,963	48%	38%	14%	387	.23	1,406,682	2,450,556

Alternative 2 also meets the overall land use mix, density and intensity goals set out. The community illustrative plan shows the green infrastructure open space and public facilities desired according to county standards. It also shows a 300-foot buffer along Bull Run and protects the historic resources west of Lenah by assigning a very low density there. The higher densities in Upper Broad Run will have higher adverse water quality impacts on Broad Run than are likely under Alternative 1, but Alternative 2 appears to do a far better job of protecting water quality in the Occoquan watershed. Modeling by the Occoquan Watershed Monitoring Lab will test this theory. The accompanying staff memo discusses the transportation impacts of Alternative 2.

Sympoetica and the planning staff look forward to the Planning Commission's comments and questions at the August 22 worksession.